NON-PUBLIC?: N
ACCESSION #: 9008060053
LICENSEE EVENT REPORT (LER)

FACILITY NAME: VOGTLE ELECTRIC GENERATING PLANT - UNIT 2 PAGE: 1 OF 5

DOCKET NUMBER: 05000425

TITLE: MANUAL REACTOR TRIP FOLLOWING DELAYS IN SYNCHRONIZATION TO GRID
EVENT DATE: 06/30/90 LER #: 90-009-00 REPORT DATE: 07/30/90

OTHER FACILITIES INVOLVED: DOCKET NO: 05000

OPERATING MODE: 1 POWER LEVEL: 18

THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR SECTION:
50.73(a)(2)(iv)

LICENSEE CONTACT FOR THIS LER:
NAME: R. M. ODOM, NUCLEAR SAFETY AND COMPLIANCE TELEPHONE: (404) 826-3201

COMPONENT FAILURE DESCRIPTION:
CAUSE: X SYSTEM: TA COMPONENT: JX MANUFACTURER: X999
REPORTABLE NPRDS: N

SUPPLEMENTAL REPORT EXPECTED: No

ABSTRACT:

On 6-30-90, a prolonged delay was experienced in rolling the Unit 2 turbine and synchronizing the generator to the grid. During this delay, reactor power was allowed to increase steadily due to xenon burnout. Since synchronization appeared imminent and to avoid production of liquid radwaste, the Shift Superintendent (SS) decided not to borate to hold power within the normal range for synchronization but rather to proceed with the transfer of Steam Generator (SG) level control to the Main Feedwater Regulating Valves (MFRV's). This action did not follow the normal sequence provided for by the Unit Operating Procedure (UOP) and, due to a further delay in synchronization, SG level control became difficult. Subsequently, a feedwater isolation and a turbine trip occurred when a SG reached its high-high level setpoint. SG levels then fell rapidly and forced initiation of a manual reactor trip at 1150 CDT.

All systems responded appropriately and by 1204 CDT the unit had been stabilized in Mode 3.

The root cause for the event was a cognitive personnel error by the SS. The SS was aware of the difficulty that could be expected in controlling SG levels with the turbine unloaded and reactor power continuing to rise. However, he elected to operate in this configuration and authorized the sequence deviation involving the transfer to the MFRV's.

The SS has been counseled and the UOP will be revised to identify procedural steps which must be performed in the specified sequence unless authorization is obtained from the Manager Operations or higher authority.

END OF ABSTRACT



A. REQUIREMENT FOR REPORT

This report is required per 10 CFR 50.73 (a)(2)(iv) because an unplanned automatic Feedwater Isolation (FWI) occurred which then resulted in a manual actuation of the Reactor Protection System.

B. UNIT STATUS AT TIME OF EVENT

At the time that the FWI occurred, Unit 2 was operating in Mode 1 (Power Operation) at 18% of Rated Thermal Power (RTP). By the time that the manual reactor trip was initiated, reactor power had been reduced to approximately 8% of RTP. Prior to the FWI, steam generator water levels were being maintained by manual control of the Main Feedwater Regulating Valves (MFRV's) and manual control of Main Feedwater Pump (MFP) speed. Preparations were being completed for synchronization of the main generator to the power grid. Other than that described herein, there was no inoperable equipment which contributed to the occurrence of this event.

C. DESCRIPTION OF EVENT

On 6-30-90, after entry into Mode 1 operation, the appropriate steps of Unit Operating Procedure (UOP) 12004-C, "Power Operation (Mode 1)," for rolling the main turbine and synchronizing the generator to the power grid were initiated. However, several problems were experienced in accomplishing these tasks. On reset of the Unit 2 turbine, the intermediate stop valves would not stay open. Also, as the turbine was brought up to speed, it was found that a +24 VDC

Permanent Magnet Generator (PMG) power supply, which provides power for the turbine control system, had failed. Troubleshooting and resolution of these problems caused a delay in preparing the main generator for synchronization. During this delay, reactor power was allowed to increase steadily due to xenon burnout. Per procedure 12004-C, generator synchronization should occur before transfer of feedwater supply from the Bypass Feedwater Regulating Valves (BFRV's) to the MFRV's. The transfer to the MFRV's should occur between 14% and 20% reactor power. However, with reactor power increasing, substantial boration and subsequent dilution would be required to maintain this sequence. Furthermore, administrative procedures provide the Unit Shift Supervisor with the latitude to allow UOP procedural steps to be performed concurrently or out of sequence provided it does not result in omission of required work, violate the intent of the procedure, or create an unsafe plant condition. Since generator synchronization appeared imminent, the Shift Superintendent and the Unit Shift Supervisor decided not to borate but to proceed with the transfer to the MFRV's and thereby avoid production of excess liquid radwaste. The transfer was accomplished at 1030 CDT at approximately 16% reactor power.



Following the transfer to the MFRV's, a further delay was experienced in synchronization because it took approximately 45 minutes to obtain the necessary switching orders from the Georgia Control Center. During this period, the turbine/generator remained unloaded. Therefore, minimal extraction steam was available for feedwater preheating which increased the difficulty of controlling steam generator levels. Shrink and swell of steam generator levels began to occur and at 1148 CDT, at approximately 18% reactor power, Steam Generator No. 2 level reached the high-high level setpoint. This resulted in a turbine trip, FWI, and trip of both MFP's. The Auxiliary Feedwater (AFW) System actuated per design. Control room operators entered abnormal operating procedure 18011-C, "Turbine Trip Below P-9," and promptly began to insert control rods and borate in an attempt to reduce reactor power to within the capacity of the AFW System. However, steam generator levels fell rapidly and a low-low level bistable actuated for Steam Generator No. 3. On receipt of the low-low level bistable, the Reactor Operator initiated a manual reactor trip at 1150 CDT.

Following the reactor trip, all control rods fully inserted. Control Room operators entered Emergency Operating Procedure (EOP) 19000-C, "E-O Reactor Trip or Safety Injection". At 1151 CDT, a manual Steam Line Isolation (SLI) was initiated to limit cooldown of

the Reactor Coolant System. After completion of the immediate operator actions required by EOP 19000-C and verifying that no safety injection had occurred, EOP 19001-C, "ES-0.1 Reactor Trip Response," was entered at 1155 CDT. By 1204 CDT, the unit had been stabilized in Mode 3 (Hot Standby) and UOP 12006-C, "Unit Cooldown to Cold Shutdown," was entered. No malfunction of plant equipment occurred following the reactor trip.

D. CAUSE OF EVENT

The direct cause of the event was extended operation (i.e., for 1 hour and 18 minutes) at low power levels with the turbine/generator unloaded and with steam generator levels being maintained by manual control of the MFRV's. The resultant shrink and swell of steam generator water levels finally caused a FWI.

The root cause of this event was a cognitive personnel error on the part of the Shift Superintendent. No unusual characteristics of the work location d
rectly contributed to this error. The Shift Superintendent was aware of the difficulty that would be experienced in controlling steam generator levels if he allowed reactor power to continue to increase with the turbine/generator unloaded. However, due to the reasons previously stated, the Shift Superintendent elected to risk operating in this configuration and directed that the transfer to the MFRV's be made out of the normal sequence as allowed by procedure.



The cause for the turbine intermediate stop valves not staying open was determined to be that the load set potentiometer signal was saturated.

E. ANALYSIS OF EVENT

While the Shift Superintendent's decision to allow the sequence deviation resulted in an undesirable operating configuration, it did not create an unsafe plant condition. A FWI and turbine trip occurred per design when the steam generator level reached the high-high level setpoint. Following the FWI, the AFW system actuated per design to supply water to the steam generators. On receipt of the low-low level bistable, the Control Room operators responded appropriately to initiate a manual reactor trip, thus precluding a challenge to the automatic trip system. Following the reactor trip, no equipment malfunction or abnormality occurred.

Based on these considerations, there was no adverse effect on plant safety or on the health and safety of the public.

F. CORRECTIVE ACTIONS

1. The Shift Superintendent has been counseled.

2. Unit operating procedure 12004-C will be revised by 9-1-90 to identify procedural steps which are to be performed in the specified sequence unless sequence deviation is specifically authorized by the Manager Operations or higher authority. The revision to 12004-C will also provide a new step for preparation of the main generator for synchronization. The purpose of this new step will be to ensure early identification of problems which could prolong low power feedwater operation.

3. System operating procedures 13800-1 and 2, "Main Turbine Operation," have been revised to provide instructions for desaturating the load set potentiometer.

4. The failed PMG power supply has been replaced.

G. ADDITIONAL INFORMATION

1. Failed Components Identification

+24 VDC PMG Power Supply
LAMBDA Electronics
G. E. Designation No. 1P1-C002



2. Previous Similar Events

None

3. Energy Industry Identification System Codes

Feedwater System - SJ
Main Turbine System - TA
Auxiliary Emergency Feedwater System - BA



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July 30, 1990
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Senior Vice President
Nuclear Operations
ELV-01959
520

Docket No. 50-425

U. S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, D. C. 20555

Gentlemen:

VOGTLE ELECTRIC GENERATING PLANT
LICENSEE EVENT REPORT
MANUAL REACTOR TRIP FOLLOWING DELAYS
IN SYNCHRONIZATION TO GRID

In accordance with 10 CFR 50.73, Georgia Power Company hereby submits the enclosed report related to an event which occurred on June 30, 1990.

Sincerely,

W. G. Hairston, III

WGH,III/NJS/gm

Enclosure: LER 50-425/1990-009

xc: Georgia Power Company
Mr. C. K. McCoy
Mr. G. Bockhold, Jr.
Mr. P. D. Rushton
Mr. R. M. Odom

NORMS

U. S. Nuclear Regulatory Commission
Mr. S. D. Ebneter, Regional Administrator
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